



## News Releases

### R&D Chronicles: The Mosquito Fighters, Part XII: The Quest for Medicine's Holy Grail

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By André B. Sobocinski, Historian, BUMED



CAPT Stephen Hoffman, Medical Corps, USN, Director of the Navy Malaria Program, 1987-2000.

*"If we can develop a malaria vaccine it will help prevent at least 200 million cases a year, and save the lives of two children every minute."*

~CAPT Judith Epstein, MC, USN, Clinical Director, Malaria Program, April 2014

With the success of recent Navy and Army-lead clinical trials of Sanaria's PfSpz (*Plasmodium falciparum* sporozoite) vaccine, medical science is on the cusp of a historic breakthrough and one that could forever shift the global health dynamic. This is a story many decades in the making and one that has crossed through the very epicenters of Naval Medical Research Center (NMRC) and its forbearer, the Naval Medical Research Institute (NMRI).

Dr. Levon Terzian may not be a recognizable name today, but from the 1940s until his retirement in 1970 he was the face of NMRI's malaria program. A former Johns Hopkins experimental biologist, Terzian would serve with Navy malaria control teams deployed to the Pacific in World

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War II and later join NMRI as a scientist.

In the late 1940s, Terzian began exploring the relationship between antimicrobial agents/antibiotics and the susceptibility to malaria. He found evidence that sulfa drugs—then commonly used when antibiotics were unavailable—could lead to a cellular breakdown in mosquitoes making them more susceptible to an “invasion” of malaria parasites. In the 1950s and 1960s, Terzian would be among the first to experiment with radiation to assess individual immunity against malaria and use gamma rays to induce sterility in disease-carrying mosquitoes.

As Terzian’s career was winding down in the late 1960s, NMRI’s malaria program could be called robust. Fueled in part by the Vietnam War, NMRI conducted extensive investigations on prophylactic and curative effects of new anti-malarials, and continued research on gamma radiation resistance in mosquitoes/mosquito-borne parasites. And in 1967, NMRI’s Division of Protozoology perfected new methods for growing large numbers of the fixed tissue stages of malaria parasites enabling greater understanding of disease transmission.

By the early 1970s, in what can be considered foundational for the future malaria research, NMRI scientists began studying the ability of irradiated sporozoites to elicit protective immunity against malaria and developed improved methods for “obtaining, separating and purifying sporozoite preparations.”

Over the next decades, the focus of the NMRI malaria program would shift towards genomics and developing an effective vaccine against malaria. Perhaps no one was more associated with this effort than Capt. (ret.) Stephen Hoffman, Medical Corps, USN. From 1995 to 2005, Hoffman’s was the most cited author for scientific papers on malaria. As Director of the NMRI/NMRC malaria program from 1987-2000, Hoffman and his team would sequence the *P. falciparum* genome, lead the first studies that showed that DNA vaccines elicited killer T cell responses in humans and conceive of a whole-parasite (sporozoite) vaccine.

Today, Dr. Hoffman stands at the helm Sanaria, a biotechnology company, and is one of the leading figures in the fight against malaria. The company—named after an etymological play off “malaria” and literally meaning “healthy air”—is dedicated to the production of the PfSpz (whole parasite) vaccine.

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